Detecting and Eliminating Illicit Discharges

Presented
to

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By
Paul R. Nelson
City of Houston

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Background of Houston's MS4 Permit

- A single MS4 Permit is shared by four co-permittees
- Each agency is responsible for implementing its own SWMP
- The five year permit became effective on October 1, 1998
  - Years 1-3 Major Program Development
  - Years 4-5 Major Program Implementation

MS4 Permit Requirements for Illicit Discharges

- The City's MS4 Permit requires a variety of programs to address illicit discharges and improper disposal:
  - Floatables program
  - HHW program
  - Sanitary sewer inflow program
  - Program to locate and eliminate illicit discharges and improper disposal to MS4

Illicit Discharge Detection and Elimination Program

- City ordinance prohibits discharge of non-storm water to MS4 (Sec. 47-741)
  - Affirmative defense allowed for certain discharges (e.g., TPDES authorized discharge, lawn watering)
- State law prohibits discharges that cause or will cause pollution (TWC Sec. 21.121)

Identification of Possible Illicit Discharges

- High monitoring/screening results
- Complaints

Monitoring & Screening Programs

- Representative Monitoring
  - 4 sites, 3 times a year
- Dry Weather Screening
  - Approx. 20 % of major outfalls/year
- Wet Weather Screening
  - 10% of dry weather screening sites
  - 100% of area served by the MS4 (though not all outfalls)

Action Levels

- Action levels were developed to evaluate questionable discharges identified by the City's field screening program
- Levels are based on national research from government sources
- Two levels
  - Elevated
  - Severe

Action Levels

Parameter	Elevated	Severe
Fecal Coliform	200 cfu/100 mL	>100,000 cfu/100 mL
Ammonia	>2.0 mg/L	>8.0 mg/L
Copper	>0.65 mg/L	>1.3 mg/L
pH	<6 or >9	<5 or >10.5
Phenols	>0.3 mg/L	>1.20 mg/L
Chlorine	>0.5 mg/L	>10.0 mg/L
Detergent	>4 mg/L	>4 and evaluated with other parameters

Response to Screening Results

Elevated

- Referred to Health Department for investigation
- If initial investigation indicates that an extensive investigation is required, possibly referred to City contractor

Severe

- Immediately referred to City contractor
- If necessary, environmental containment and cleanup initiated

Public Reporting of Potential Illicit Discharges

Complaints can be received several ways:

- 311 Program
- Health Dept.'s Hotline
- TCEQ/EPA

Response to Complaints

- Health Department
- Public Works and Engineering Department
- Police Department

Complaint Investigations in Most Recent Annual Report

- 1989 complaints of dumping of solid/hazardous waste investigated
- 107 complaints of used motor oil investigated
- 500 complaints of water pollution/ illicit discharges investigated

Enforcement Mechanisms

- Notices of Violation
- Municipal Court Citations
  - Fines between $250 and $2000
- Civil lawsuits for injunction and recovery of damages
- Referral to District Attorney for violations of TWC
- Suspension of utility service and MS4 access

Extended Investigations

- Ongoing/repeat discharges
- No readily-identifiable source
- Example: Brays Bayou Representative Monitoring Site

Brays Bayou Investigation

- Samples of discharges from another co-permittee's representative monitoring site exhibited high concentrations of fecal coliform, streptococci and enterococci
- Because of the possibility that the storm sewers in the area were interconnected, the City was concerned that the high bacterial levels could have come from a sanitary sewer overflow (SSO) from the City's sanitary sewer system

Brays Bayou Investigation

- Houston initiated an investigation to determine if SSOs or illicit connections were involved
- A windshield survey was performed for the drainage area to rule out obvious sources
- Historic drawings for the storm sewer system were located

Brays Bayou Investigation

- The City's contractor conducted a field investigation to determine whether the City's storm sewer system was cross-connected with the other agency's storm sewer system
- The field investigation also included locating City sanitary sewers in the area to determine the proximity of the City sanitary sewers to the other agency's storm sewer system

Results of the Field Investigation

- No evidence of a City sanitary sewer connecting to the other agency's storm sewer system
- One possible connection of City storm sewer to the other agency's storm sewer significantly upstream of where the high bacteria levels were found
- No evidence of a SSO

Brays Bayou Investigation Sampling

- After the field investigation, wet weather sampling was conducted at 7 locations along the other agency's storm sewer to pinpoint where the bacteria discharged into that system
- A second set of samples was collected one hour and 20 minutes later
- Sample parameters: ammonia and fecal coliform

Sampling Results

- The first sampling data set indicated high levels of fecal coliform at the three sites in the downstream portion of the storm sewer
- The second sampling data set also had high readings at two of those three sites
- The four upstream sites had significantly lower levels of fecal coliform both times

Other Possible Sources

- While conducting this investigation, the contractor observed a considerable number of pigeons under an overpass where the other co-permittee's road crosses a City street
- This area drains into the portion of the storm sewer where the high bacteria levels were found
- The current plan is to conduct additional sampling at specified inlets and manholes to directly pinpoint the source(s) of the bacteria

Closing Points

- Importance of coordination among City departments, divisions and contractors
- Importance of coordination among co-permittees
- Not all sources of pollutants are easily identifiable

Houston's Illicit Discharge Detection and Elimination Program